CONCEPTUALIZING INTERACTION WITH ERP SYSTEMS USING ADAPTIVE STRUCTURATION THEORY

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ABSTRACT

The new brand of Information Systems (IS) is Enterprise Resource Planning (ERP) and while lots of studies have used functional and networking type IS to operationalize adoption (or system usage) measures, ERP systems have yet to mature in that area. Despite system usage being an important variable in IS research over the last three decades, IS researchers have in the past on many occasions, attempted and failed to capture the complex and iterative processes behind this experience and adoption of new technology. Though suited and common in studies of functional and transactional systems, this article argues that system usage; in its present form, is inadequate to represent the dynamic and iterative processes that occur between the user and more advanced technologies such as Enterprise Resource Planning (ERP) systems. Conceptions of system usage have been criticized for a lack of theoretical underpinning, unsystematic approaches towards operationalization of measures, and mixed results about the link between system usage and individual performance. Consequently, the authors suggest Interaction as an all encompassing dimension that extends beyond the previously popular quantitative usage measures and best accounts for the user's experience. This paper's objective is to contribute to knowledge: a new approach towards conceptualizing the Interaction between users and ERP systems for an IS success domain. The authors do this by leveraging Adaptive Structuration theory to introduce dimensions of structures, Interaction and impacts, and a comprehensive set of Interaction measures for operationalization.

1 INTRODUCTION

The total software revenue for ERP (synonymous with Enterprise Systems and Enterprise IT) software market was reported at 16 billion dollars in 2005 (Gartner, 2006). ERP software adoption growth rates in emerging markets in Asia/ Pacific regions, backed by their fast growing economies, have continued to outpace overall market growth by two to three times. The technology infrastructure supporting ERP has also advanced with the emergence of next generation (3G) mobile communications systems, characterised by high bandwidth, high speed data services, wireless and digital services. It is this relentless market growth that is fuelling immense pressure to benchmark the successes of such major investments (Shanks et al., 2003). An important aspect of study for many researchers is the adoption of such advanced technology, and system usage has been one popular construct utilized in IS success domain for that purpose. This conceptual paper extends findings from Sedera and Tan (2007), which suggests at the offset that ERP interaction is broader and encompasses more complexities than previously popular quantitative system usage measures for realising the complete user experience. Especially in the IS success domain, the role of ERP system usage is still unclear, attributed to a lack of a strong theoretical underpinning for explaining the deep processes that occurs between technology and its users. Answering calls from recent literature (DeLone and McLean, 2003; Burton-Jones and Straub, 2006), this article proposes a contextualized approach and the leveraging of Adaptive Structuration Theory (AST) (DeSanctis and Poole, 1994) towards defining ERP interaction. This includes 1) capturing individual user's attitude towards interacting with system, 2) his intentions of the interaction and its alignment with the values infused in the design of the system by its developers, and 3) comparing individual uses with that it was designed for to evaluate deviant use. This study aims to extend AST in several areas (Table 1) with referent to Cameron and Whetton's (1981) guidelines to assessing organizational effectiveness. It is pointed out that this conceptualization for the IS success

domain at this stage is derived in consideration using an ERP context only. Generally, this paper would seek to (1) identify the problem of conceptualizing interaction and its value, (2) identify the suitable theory, (3) identify the context and defined the dimensions relative to theory and context, (4) define the relationships between the dimensions, (5) identify the measures of each dimension and (6) define the measures relative to the context.

Cameron Whetton's (1981) Questions of Analysis and Description	**Level of analysis-** Interaction judgments can be made at many levels: individual, group, organizational.	**Domain of activity-** Different domains of activity are conducted by the stakeholders in organizations and they are judged differently.	**Perspectives-** It is important to make explicit who is defining and assessing effectiveness	**What time frame is being employed?-** Long-term effectiveness may be incompatible with short-term effectiveness,
DeSanctis and Poole (1994)	Group	Functional IT processes in Group Decision support systems	2 groups using similar Group Decision Support Systems for prioritizing projects for organizational investment	Short term (several hours)
This study	Individual	Integrated Enterprise Resource Planning subtasks	Operational Staff using mySAP ERP 6 for Procurement and Order fulfillment business processes	Mid-term (over 10 weeks)

Table 1: Extensions to DeSanctis and Poole (1994)

The article follows with an articulation of the Enterprise IT characteristics with brief explanations about the inappropriateness of popular usage measures in such an ERP context. The article continues with key propositions of AST that makes it suitable for the purposes of understanding Interaction in ERP. Next, a discussion of key dimensions and propositions of the research model is presented, including detailed insights to major sources of ERP structures (including system, spirit, task characteristics and information) as antecedents to ERP interaction, the dynamic processes of ERP Interaction and the likely measures, and the impacts of varying interaction. The article concludes with a brief discussion on how new conceptions of Interaction are applicable in modern day ERP systems.

2 LITERATURE REVIEW

Trice and Treacy (1988, p.33) defines system usage as "either the amount of effort expended interacting with an IS or, less frequently, as the number of reports or other information products generated by the IS per unit time". Usage has been commonly employed in scholarly studies in four paradigms: (1) IS for decision-making, (2) IS implementation, (3) IS acceptance and (4) IS success (Burton-Jones and Straub, 2006). Usage in the IS success domain in particular, has predominantly been conceptualized as an event in an input-process-output causal relationship between quality and impact of an information system (DeLone and McLean, 1992; Goodhue, 1995; Gable et al., 2003; Sedera et al. 2004). This section summarizes highlights of a recent analysis of 28 studies across 15 journals and conferences[1] that have featured Usage as an independent variable of IS success, in order to realise (1) the issues with Usage in IS success, (2) the inadequacies of previous Usage conceptions for Enterprise IT and (3) the need for a suitable theory to capture user interaction within Enterprise IT systems.

[1] Examples are Information Systems Research (ISR) and MIS Quarterly (MISQ), Others include Computers in Human Behaviour (CHB), Computers in Industry (CI), Harvard Business Review (HBR) International Conference of Information Systems (ICIS), Americas Conference of Information Systems (AMCIS) and European Conference of Information Systems (ECIS). Authors acknowledge that there could be other studies that have employed USAGE as an independent variable, although we believe that these 28 studies represent a reasonable sample of USAGE over the past decade. Full details of the analysis are available from the authors upon request.

2.1 Issues with Usage in IS success

DeLone and McLean's (1992) IS success model is the first and one of the most widely cited (Heo and Han, 2003, Myers et al., 1998) to identify usage as an important dimension of IS success. The model is an attempt to represent the interdependent, process nature of six IS success constructs: (1) system quality, (2) information quality, (3) usage, (4) user satisfaction, (5) individual impact, and (6) organizational impact. Since then, several authors have raised problems associated with including Usage as an IS success measure. In non-mandatory use systems, Seddon (1997) calls for the omission of IS use in a process (Meaning 3) view of IS success and suggests that Usage be described as behavior. Rai et al. (2002) and DeLone and McLean (2004) has taken a view similar to Seddon (1997) in their study of Student Information Systems and e-commerce websites respectively, where Usage for both contexts is not mandated. These studies further posit that Usage is an objective (quantitative) measure of the net benefits for volitional and voluntary IS. Sedera and Gable (2004) empirically demonstrated that Usage is inconsequential in a non-volitional Enterprise System. Summarizing results from the analysis of past literature: (i) very few studies have looked at qualitative measures, (ii) there is a lack of a consensual definition and theoretical grounding of Usage, (iii) very few studies have looked at information Use, and (iv) a general lack of system usage studies featuring Enterprise IT. The last two points would be discussed in greater detail relative to an Enterprise IT context.

2.2 Issues with Usage for Enterprise IT

Enterprise IT is the third category of McAfee's (2006) three-tiered classification of systems. McAfee (2006) states that many traditional IS (Functional IT) assisted organizations in executing discrete tasks, while the networking systems (Network IT), provided a means by which people can communicate with one another. Many researchers employed Usage as a key construct to determine success of Functional IT (FIT), such as MS-Excel (Jain and Kanungo, 2005; Burton-Jones and Straub, 2006) and decision support systems (Devarai and Kohli, 2003; Lilien et al., 2004). Usage had also been employed as a construct to measure Network IT (NIT) systems including Email (Igbaria and Tan, 1997; Rice, 1994) and voice-mail (Straub et al., 1995). The Enterprise System however, is characterized by a redesigning of business processes, standardizing workflows (Brady et al. 2001), and near mandatory Usage (McAfee, 2006). Applications such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM) and Supply Chain Management (SCM) fall into this category. Enterprise systems are unique as they are not just software but they impose their own logic on a company's strategy, culture and organization (Davenport, 1998, p122). In so doing, business process re-engineering of a certain level is necessary and a new pattern of behaviour is promoted. While quantitative measures are effective for FIT and NIT systems characterized by non-mandatory use, the authors believe that these measures are largely inadequate for EIT. In case of mandatory systems such as EIT, DeLone and McLean (2003) have pointed that simply measuring the amount of time a system is used does not properly capture the relationship between Usage and the realization of expected results. For mandatory use EIT systems, the need for more qualitative (perceptual) measures is reflected in Seddon (1997, p252) calls for researchers to capture the views of senior management (whose direct usage levels are generally lower) besides the employees. Extending the discussion on user groups, Gable Sedera and Chan (2003) identified four (strategic, managerial, technical and operational) key stakeholder groups for the modern day EIT systems. Each stakeholder group can be distinguished by the levels of information and system Usage; with strategic managers having a higher level of information Usage than traditional use of the system. As such, a sound theory that considers the nature of Enterprise Systems and its environment would add value to defining the Interaction associated.

2.3 Why Adaptive Structuration Theory?

DeSanctis and Poole's (1994) Adaptive Structuration Theory looks at the role of advanced information technologies (AIT) and variations in organization change from two aspects: 1) the type of structures

that are provided by AIT (and, hence, anticipated by designers and sponsers) and 2) the structures that actually emerge in human action as people interact with these technologies, and incorporate them in their work practices. However, the authors will not consider the second in this article, not at this stage of the research at least.

2.3.1 Capturing Interaction and Multiple Stakeholders view

DeLone and McLean (2003) suggest that all researchers should address the extent, nature and appropriateness when looking at system usage. This is believed to be captured through DeSanctis and Poole (1994)'s AST, and more specifically the dynamics of appropriation process introduced, which captures how various stakeholders (users, managers, information systems professionals and those mentioned previously) think about the advanced information systems they develop and use. Furthermore, Orlikowski and Gash (1994) argued that understanding the assumptions, expectations, values, and beliefs (i.e. cognition) of these stakeholders can lead to more successful outcomes. Burton-Jones and Straub (2006) highlighted the importance of capturing the use of the system for the task through deep structure usage. In AST, this process is captured within structuration (Giddens, 1984), a fundamental underpinning in AST, which posits that systems and structures exist in a dual relationship with each other such that they produce and reproduce each other in an ongoing cycle. This dynamic, referred to as the structuration and embedded within the appropriation process, captures the social phenomena of organizational change that emerge over time as users apply specific technology-based rules, resources or norms, within specific contexts, at specific points in time. When these structures are applied through another process named Appropriation, they may be modified, enhanced, or combined with manual procedures. Similar to the concept of attractors (from Carroll et al. 2003) in the model of technology appropriation (Carroll et al. 2002b), it is conceived that the adequacy of these structures, captured through the goodness of the system and its information initiates the process of appropriation. The next chapter describes the structures identified in an ERP context that is relevant in the process of appropriation and our conception of ERP interaction.

2.3.2 Input-Process-Output model

Comparing the widely cited DeLone and McLean (1992) model of IS success with that of the propositions of AST, the authors found obvious similarities. As mentioned previously, usage in the IS success domain in particular, has predominantly been conceptualized as an event in an input-process-output causal relationship between quality and impact of an information system. In other words, the propositions of the widely cited model of IS Success (DeLone and McLean, 1992) are as such: System quality and information quality lead to Use and Use in turn induces an individual impact and organizational impact. The propositions of AST suggest that: The goodness of structures of the technology leads to an associated level of appropriation. And Group outcomes (decisions, planning, ideas), rather than resulting directly form the effects of variables such as technology and task, reflect the manner in which groups appropriate the structures of the technology (DeSanctis and Poole, 1994). Leveraging the concepts in AST and the propositions in IS success, the authors proposed an input-process-output model of ERP interaction (Figure 1).

3 STRUCTURES IN ERP

DeSanctis and Poole (1994, p129) suggests six (i.e system, system outputs, task, task outputs, environment, environment outputs) major sources of structures that exist in an organization involved in the interaction process. Contrary to DeSanctis and Poole's (1994), the authors have identified 3 (i.e system, task and information) relevant sources of ERP structures (Table 2) for the context of this study. The authors have excluded discussions of environment and environment outputs from this article as the conduct of our study is planned for in an environment where the rules and principles of action drawn from society and organization are controlled. The authors do acknowledge that the existence and study of environmental impacts (such as level of remoteness of firm's location, planning time horizon, quality of strategic business planning, function specialization with organization, formalization of documentation) on Information systems success have been ongoing for more than two decades (Raymond, 1985; Olson and Chervany, 1980; Premkumar and King, 1994).

Structure Source	Definition(s)	Examples in ERP context
System	System hardware, software and procedures (DeSanctis and Poole, 1994)	mySAP ERP software, modules, screens, local printer and other peripherals such as mouse and keyboard
Task	Activity that a task doer accomplishes to achieve a goal (MacMullin and Taylor, 1984)	Creating vendor and customer master records, adjusting prining settings for customer, receiving purchase order or customer payment
Information (System and Task Outputs)	Data, text or other results produced by the system and as a result of operating on task data or procedures (DeSanctis and Poole, 1994)	graphs, purchase order numbers, list of customers and vendors, financial statements and chart of accounts

Table 2: Major sources of structures in ERP and examples of each

The authors have also found no need of or no great divide in the outputs produced by the system and the tasks, attributing to the use of information quality as the overall construct. The authors previously suggested conceptual workings of appropriation best replicates the complex iterative processes of interactions and thus AST as the best theory. Extending that, the authors define appropriation as the application, adoption and adaptation (Carroll et al. 2002a) of structures (DeSanctis and Poole, 1994) during interaction. It is further posited that the dimensions of appropriation collectively represent a quantitative assessment of interaction. The authors don't however at this stage, know what its (interaction) relationship with Usage is. In an ERP context, the authors first define structures broadly as technology procedures, skills, knowledge that influences the engagement of the system for important business (such as procurement and order fulfilment) processes. In order to study the effects of structures of ERP on interaction, the sources of ERP structures must first be clearly articulated. Consistent with IS success, the goodness of these structures have a significant bearing on the level of interaction experienced by the user.

3.1 ERP in action

Although it is important to acknowledge the existence of structures from systems, tasks and their outputs, it is more important to study their nature/ characteristics and how they affect the intended levels of interaction. This section looks closely at each source of ERP structure and guides us towards means of evaluating the goodness of each. Appropriation as posited in AST refers to the manner in which a group for its own use- through the structuration process- adopts and adapts these technology structures. In addition, the authors will introduce the key hypotheses to this conceptualization of ERP interaction that would become the basis of future work.

Spirit and Quality of the System: According to the Gartner group, Enterprise Systems (synonymous with ERP systems) and the Internet are the two most important IT developments to emerge in the 1990s, with many of the Fortune 100 firms turning to enterprise software solutions to run their businesses. ERP software applications offer to support submarkets in productions/operations, financials, human resources and Enterprise Asset management. The goals of these enterprise software applications are: (1) to automate and integrate business processes, (2) to share common data and practices across entire enterprise and (3) to produce and access information in a real-time environment (Shanks et al. 2003) Consistent with AST, the authors define these goals and values intended by the developers for the ERP systems as the Spirit of the systems. Closely related to the concept of faithfulness, the spirit of the systems to the users and the designers are sometimes not alike, leading to poor system designs, poor interaction and ultimately poor performance.

While spirit is important, capturing how the ERP system performs from a technical and design perspectives are important considerations for predicting users' interaction with the system. The better the structures (referring to examples from table 2), the more likely the users would apply them in interacting with ERP, a process previously defined as appropriation. Sedera et al. (2004) identified and tested ten aspects of evaluating the quality of a system including: consistency of the user interface,

ease of learning and ease of use. System quality also refers to the goodness of ERP system's functionality, sophistication and integration of the system. Summarizing, the better the quality of the system, the more likely the user would interact with the system.

Quality of Task: Adapting MacMullin and Taylor's (1984) work on problem dimensions and information traits, the authors suggest three definitional components of the concept of task: (1) the initial state; (2) the goal state, and (3) the mental and physical processes required to move from the initial state to the goal state. Kim and Soergel (2006) later developed a classification scheme that dissects the different characteristics of tasks from previous literature based on four distinct dimensions. From this topology, the authors have identified a set of suitable ERP task characteristics to assess the goodness of this structure. (1) Intrinsic task characteristics are inherent to the task and include measures such as task difficulty- the degree of effort required to complete the task, task adaptability- the degree to which a task is adaptable in different settings and task learnability- the degree to which a task is easy to learn. Certain popular intrinsic characteristics like task complexity were dropped (Kim and Soergel, 2006). Quoting an example from Campbell (1988) to distinguish task complexity from difficulty; a simple task like planting a flower requires less effort than that of laying a foundation although both are not complex tasks. (2) Extrinsic task characteristics are external to the task and include task significance- the degree to which the task has substantial impacts on people (Hackman and Oldham, 1976) and task reward- the degree to which the task is fulfilling and rewarding for the task performer (MacMullin and Taylor, 1984). (3) Task performers' interaction with each other (if any) and (4) Relationship between Task and Performer which includes intrinsic interest- the degree to which the task is of interest to the task performer, Belief in success- the degree to which the task performer believes he would be successful in completing the task (Kim and Soergel, 2006). In summarizing, the authors anticipate the better the quality of the tasks, the more likely task performers would repeatedly perform the same or similar tasks. It is also anticipated that practice improves accuracy and speed of performance on tasks (discussed also in Gibson 1969; Welford, 1968).

Quality of Information: In AST, outputs produced by a system refers to data, text or other results produced, following input by its users and tasks outputs refer to the results of operating on task procedures or completing parts/all of a task. As previously mentioned, the authors see no need, for this context, to logically divide the two types of outputs, at least in terms of their measurement. Here the focus is on the quality of SAP system and task outputs: namely, the quality of the information the system produces in reports/ print-outs and on-screen. Information quality, as suggested in Gable et al. (2003), thus is concerned with such issues as the relevance, timeliness and format of reports, and the accuracy of information generated by the SAP system, which is as a result of tasks/subtasks completion. Summarizing, the better the quality of the task outputs from the system, the more likely the task performers would continue interacting with the system.

H1: Interaction with ERP may vary depending on the goodness of its structures. In other words, the better the quality of ERP structures, the higher the level of interaction between the system and its users.

H2: ERP provide structures that can be described by their spirit. Consistent with AST, to the extent that as the spirit of advanced technology such as ERP varies, different forms of interaction are encouraged.

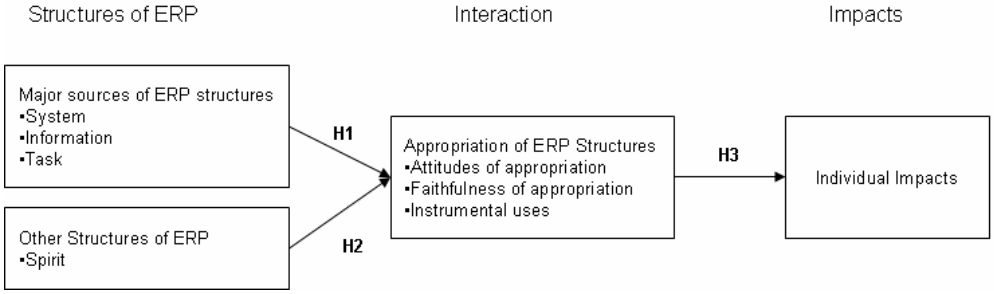

Figure 1: Summary of constructs and propositions of ERP interaction

3.1.1 Defining ERP Interaction and its dimensions

At the offset, the authors' conceptions and propositions of Interaction are derived from the concept of appropriation. Interaction is not appropriation but it is captured using propositions suggested in AST. Interaction, for our study, is a collection of dynamic and iterative appropriation processes that occur between users and the contemporary IS. The measurement of the level of appropriation is captured through three dimensions; the (1) Attitude towards appropriation, the (2) Faithfulness of appropriation and the (3) Instrumental uses. It is noteworthy that there is a fourth dimension Consensus of appropriation amongst groups, posited in AST (DeSanctis and Poole, 1994), but its been dropped as the level of analysis in our study is individual users as opposed to groups interaction.

The first dimension attitude captures the user's feelings and emotions of users as he applies and adopts the structures highlighted in Table 2 for whatever purposes. It does not include the user's perceptions about the goodness of system or its structures in Table 2. Attitude is considered to be the vehicle that reflects the stability of the appropriation process (Gopal et al., 1992).

The second dimension faithfulness captures the intentions for the system as perceived by its users. It is important as the authors compare and align these intentions for the system as perceived by its users against those goals and values as posited by its developers (Chin et al., 1997). These goals and values for the system, as described by its developers are called the spirit. Faithful Appropriations are consistent with the spirit, whereas unfaithful Appropriations are out of line with the spirit of the technology. Unfaithful Appropriations help explain how IS structures do not always bring the outcomes (IS-impacts) that designers intended (Chin et al., 1997). This construct aligns with propositions by DeLone and McLean's (2003) for measures that evaluate "appropriateness" of Usage.

The third dimension (instrumental uses) captures the extent of use for the system. It is important to understand the different purposes in which the users employ the systems for in an attempt to identify any deviant or defiant use. The instrumental uses dimension is different from faithfulness as they are constrained by the features of the system (eg. nature and extent of communicative uses will vary between 3G and 2G devices, wireless and digital type enterprise applications), and system features are underpinned by its values and goals captured in faithfulness. Stakeholders may choose to appropriate the features for different instrumental uses, or purposes such as tasks or exploratory (DeSanctis and Poole, 1994).

In applying Poole and DeSanctis's (1990; 1994) articulation of AST, it is suggested in the ERP context that for an ERP to have its intended effects (improved impact etc), its structures should be appropriated in a stable manner. For an appropriation to be stable, the system should be (1) faithfully appropriated, (2) the individual's instrumental uses for the system are high, and (3) the individual's attitudes toward the system should be positive. It is also noteworthy that AST explains the duality of structures: The structures that arise from these sources can be adapted in appropriation to form new structures. However, by taking measurement at a snapshot in time, the study would not address the presence of new structures or its impact at this present stage. Table 3 summarizes the measures reflective of these three dimensions.

Interaction for an ERP context can thus be broadly defined as a subjective and deeper evaluation of the way the user applies technology procedures, skills, knowledge within ERP for completion of business tasks (eg. procurement and order-fulfilment). The authors envisage an assessment of Interaction is necessary to study its effects on individuals and must encompass all three dimensions to cover nature (attitude- deep thoughts about use, inner feelings), extent (instrumental uses- whether the use was too much, too little, too far off its purpose) and appropriateness (faithfulness- alignment with developers intent, misuse etc) of use. This view is reflective of the work of DeLone and McLean (2003), which claims is lacking in past system usage conceptions within the IS success domain. Adopting the assumptions in IS nomological net that usage has a casual relationship with individual impacts (Benbasat and Zmud, 2003); The authors posit a possible relationship between the level of interaction and individual impacts. Traditionally, individual impacts are concerned with how SAP system has influenced the user's individual performance (DeLone and McLean, 1992; Goodhue, 1995). Once

again, adapting Sedera et al. (2004), individual impacts in this study seek to assess whether the ERP system has helped users' (e.g.): ability to interpret information accurately, understanding of information and related activities, decision making effectiveness, and overall productivity.

H3: Individual impacts of ERP may vary depending on the level of interaction. In other words, employees who experience a better interaction with ERP will receive more positive impacts from the system than employees who do not.

Constructs	Sub-Constructs	Defintions	Studies
Attitude	level of comfort	A user's confidence and ease in interaction	Gopal, Bostrom and Chin (1992), Poole and DeSanctis (1994)
	level of respect	The value a user place on the structures provided by the ERP system	Gopal, Bostrom and Chin (1992), Poole and DeSanctis (1994)
	level of challenge	The sense of challenge and accomplishment from ERP interaction	Gopal, Bostrom and Chin (1992), Sambamurthy (1989)- unpublished thesis
Instrumental Uses	Task oriented	Use of ERP for setup/ configuration purposes	Adapted from DeSanctis and Poole (1994)
		Use of ERP for task/ subtask execution purposes	Adapted from DeSanctis and Poole (1994)
	Exploratory	Use of the system for exploration purposes	Adapted from DeSanctis and Poole (1994)
	Confusion	Use of the system with no real purpose or objective	Adapted from DeSanctis and Poole (1994)
	Enforcement	Measures if user has a choice with using the system	New Scale
Faithfulness	Standardization	Perceived level of standardization of task related features (eg. data format, screens, languages)	New Scale
	Integration	Perceived level of integration of sub-tasks	New Scale
	Real-time environment	Perceived production of real-time information by the system	New Scale

Table 3: Attitude, Faithfulness and Instrumental uses of ERP Interaction

3.1.2 Implications for 3G ERP

The above findings and concepts can be directly applied to study user's experience with 3G enterprise applications, a reflection of the improvements to modern day ERP systems. Especially since the goals of these enterprise software applications (referred as the Spirit of the system) remain the same: (1) to automate and integrate business processes, (2) to share common data and practices across entire enterprise and (3) to produce and access information in a real-time environment. Specifically, the level of interaction can be assessed through the stability of appropriation or how well users take possession of the enterprise applications' capabilities in order to satisfy their task needs. From a 3G systems perspective, Ephriam Schwartz (2005a; 2005b) has questioned the reliability of the 3G network and that of wireless applications (those in phones and handhelds such as IPAQ) they support. high bandwidth, high speed data services, wireless and digital services. Therefore, comparing individuals' (from all stakeholders) interaction with relatively new 3G enterprise applications against the previous generation of ERP devices could be an important area of research in future.

4 CONCLUSION

In concluding, ERP systems have enjoyed considerable market growth in the last decade and interaction with such advanced technology is conceived to be broader and encompasses more complexities than previously popular quantitative system usage measures. This paper has attempted to conceptualize and position ERP interaction in the IS success domain. In so doing, the authors have introduced three major concepts and several new considerations: (1) ERP structures: where major sources include system and its spirit, task and information; (2) Appropriation of structures- where the goodness of the interaction is indicated by level of appropriation. (3) Individual impacts from ERP Interaction. For knowledge, the authors suggest that understanding Interaction between System and

User would more accurately predict the impacts of a successful IT implementation. For practice, the authors aim to derive the model of ERP interaction and suggest its fit into the ERP (including more advanced 3G ERP applications) post-implementation lifecycle. In addition, the authors intend to derive a complete set of context specific interaction measures to help managers maximize the value of completing ERP user-enabled tasks/ subtasks. As understood, this conceptual paper is lacking content in areas (eg differentiating tasks and information characteristics in 3G context, other employment cohorts besides operational staff and the duality of structures). However, the authors will address these concerns in our next revisions where a research method to test and confirm the relationships would also be established.

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